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Indian Standard

SPECIFICATION FOR VENEERED-WOOD BOARDS FOR PACKING CASES

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SPECIFICATION FOR VENEERED-WOOD BOARDS FOR PACKING CASES

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Indian Standard

SPECIFICATION FOR VENEERED-WOOD BOARDS FOR PACKING CASES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 17 November 1968, after the draft finalized by the Wood Products Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Wooden packing cases and boxes are being used in the country in large quantities for packing a wide variety of commodities and articles. Since there is a general shortage of timbers suitable for packing cases in the country, the cost of such containers is going up and the supply prospects are becoming difficult day by day.

0.2.1 In view of **0.2**, veneered-wood boards are now being used in increasing quantities for the manufacture of packing cases and boxes. This standard lays down the method of manufacture, the requirements and tests for such boards with a view to helping in the production of such boards. This material is different from blockboards for commercial and decorative purposes, covered by IS : 1659-1960*.

0.3 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements of veneered-wood boards intended for packing cases and boxes and similar work.

*Specification for blockboards.

†Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definition and those given in IS : 707-1968* shall apply.

2.1 Veneered-Wood Boards — A board having a core made up of solid wood planks, each not less than 80 mm in width, glued or otherwise jointed to form a slab which is glued between two outer veneers with the direction of the grain of the core running at right angles to that of the outer veneers.

3. GRADES

3.1 Veneered-wood boards shall be of the following two grades:

- a) Grade 1 for the manufacture of packing cases or boxes to be used as 'storage packs'.
- b) Grade 2 for the manufacture of packing cases or boxes to be used as 'transit packs'.

4. MATERIALS

4.1 Timber

4.1.1 Core — Timber for cores shall conform to class II or class III of IS : 303-1960†.

4.1.2 Face Veneers — Timbers for face veneers shall be of class I or class II of IS : 303-1960†.

4.2 Adhesives — The adhesives used for bonding purposes shall be the WWR and unextended CWR types conforming to IS : 848-1957‡ for Grade 1 and Grade 2 boards respectively.

5. MANUFACTURE

5.1 Construction — The veneered-wood boards for packing cases shall be of three-ply construction.

5.2 Core — The core strips shall be cut out from the timbers specified in 4.1.1 and seasoned to a moisture content not exceeding 12 percent. The width of each strip shall not be less than 80 mm, and its length not less than the length of the board. In any one board the core strips shall be of one species of timber only.

*Glossary of terms applicable to timber and timber products (*revised*).

†Specification for plywood for general purposes (*revised*).

‡Specification for synthetic resin adhesives for plywood (phenolic and aminoplastic).

5.3 Faces — Veneers used for faces shall be sawn/sliced/rotary cut and shall be reasonably smooth.

5.4 Veneered-wood boards shall be made by gluing core strips between veneers.

5.5 Unless otherwise specified, the nominal thicknesses of the veneered-wood boards, core stock and veneers for faces shall be as follows:

<i>Veneered-Wood Board, mm</i>	<i>Core Stock mm</i>	<i>Veneers for Faces, mm</i>
9	6	1·5
13	9	2·0
16	10	3·0
19	13	3·0

5.6 Permissible defects and tolerances on thickness for veneers shall conform to IS : 303-1960*.

6. WORKMANSHIP AND FINISH

6.1 The boards shall be of uniform thickness within the tolerances specified in 7.3.

6.2 All boards shall be flat and their faces reasonably smooth. The edges of the boards shall be trimmed square within 3 mm.

7. DIMENSIONS AND TOLERANCES

7.1 The dimensions of the veneered-wood boards shall be quoted in the following order:

The first dimension shall represent the length, that is the dimension parallel to the grain of faces; the second, the width; and the third, the thickness.

7.2 Dimensions — Unless otherwise specified, the veneered-wood boards shall conform to the following dimensions:

<i>Length</i>	<i>Width</i>	<i>Thickness</i>
cm	cm	mm
120, 90, 60	60, 30	9, 13, 16, 19

7.3 Tolerances — The tolerances on dimensions shall be as follows:

<i>Dimension</i>	<i>Tolerance</i>
Length	±6 mm
Width	±3 mm
Thickness	±0·5 mm

*Specification for plywood for general purposes (revised).

8. SAMPLING

8.1 In any consignment, all the veneered-wood boards of the same grade and dimensions and manufactured under similar conditions of production shall be grouped together to constitute a lot.

8.2 The number of veneered-wood boards to be selected from a lot shall be as follows:

<i>Lot Size</i>	<i>Number of Veneered-Wood Boards to be Selected</i>
<i>N</i>	<i>n</i>
Up to 50	2
51 „ 100	3
101 „ 200	4
201 „ 300	5
301 „ 500	7
501 and above	10

8.2.1 The veneered-wood boards shall be selected at random. In order to ensure randomness of selection, all the veneered-wood boards in the lot may be arranged in a serial order and every *r*th board may be selected till the required number is obtained, *r* being the integral part of N/n where *N* is the lot size and *n* is the sample size.

9. TESTS

9.1 Preparation of Test Specimens — From each of the veneered-wood boards selected, the following test specimens shall be cut out from the portion 15 cm away from the edges and avoiding any joints in the core slab. A tolerance of ± 1.5 mm shall be permissible on the length and width of the test specimens. Each test specimen shall be rectangular with all edges cut square to the surface:

- One test specimen of size 20×10 cm for the test specified in **9.3**,
- Two test specimens of size 20×10 cm for the test specified in **9.5**, and
- Two test specimens of size 15×2.5 cm for the test specified in **9.5**.

9.2 Conditioning of Test Specimens — With regard to tests covered in **9.3** and **9.4**, the prepared test specimens shall be suitably conditioned and the procedure adopted shall be reported.

NOTE — Exposure for 24 hours to the air of a well-ventilated room will often suffice, but if a greater degree of accuracy is required the test specimen shall be exposed to an atmosphere maintained at a temperature of $27^\circ \pm 2^\circ\text{C}$ and a relative humidity of 65 ± 5 percent until they are substantially constant in weight.

9.2.1 Test specimens cut from each of the boards selected in accordance with **8.2** shall satisfy the tests laid down in **9.3** to **9.6**.

9.3 Variation in Thickness — When tested in accordance with Appendix A, the variation in thickness shall be within the tolerance limits prescribed in **7.3**.

9.4 Adhesion of Plies — The adhesion of plies shall be tested by forcibly separating the surface layers from the underlayment by the use of a prising knife. The veneers shall offer appreciable resistance to separation and the fractured surfaces shall show some adherent fibres distributed more or less uniformly.

9.5 Resistance to Water — When tested in accordance with Appendix B, the test specimens shall satisfy the requirements of **9.4**.

9.6 Mycological Test — When tested in accordance with Appendix C, the test specimens shall show no appreciable signs of separation at the edges.

9.7 Re-test — If the samples selected as specified in **8.2** are found not to be fully complying with the requirements of **9.3** to **9.6** a further similar set of samples shall be taken at random from the same lot and subjected to the tests. If any of the samples in the second lot is also found not to comply fully with the requirements of tests, all the boards in the lot represented by the samples shall be rejected.

10. PRESERVATIVE TREATMENT

10.1 After inspection, the accepted supplies shall be treated by momentary dipping (dip-in-dip-out treatment) in a suitable preservative solution, as agreed to between the purchaser and the supplier.

11. DELIVERY

11.1 The veneered-wood boards shall be supplied in a clean and dry condition and shall be suitably packed according to the approved trade practice, unless otherwise specified by the purchaser.

12. MARKING

12.1 Each veneered-wood board shall be legibly and indelibly marked or stamped with the following information:

- Manufacturer's name or initials or trade-mark,
- Grade, and
- Year of manufacture.

12.2 All markings shall be done on the face of the board near one edge.

12.2.1 Each board may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

A P P E N D I X A

(*Clause 9.3*)

TEST FOR VARIATION IN THICKNESS

A-1. PROCEDURE

A-1.1 Each test specimen shall be tested for thickness.

A-1.1.1 The thickness shall be measured in millimetres to an accuracy of ± 0.02 mm. The contracting surfaces of the measuring instrument shall be flat and shall have a diameter approximately 6 mm. Eight readings shall be taken approximately 20 mm inside the edges of the test specimens, namely, at the four corners, and at the mid-points of the edges.

A-2. REPORTING OF TEST RESULTS

A-2.1 The mean thickness of each of the test specimens shall be reported together with the mean of the eight readings.

NOTE — It is essential that the thickness is measured at a sufficient number of points distributed over the whole area of the board to ensure that a reasonably true average value is obtained.

A P P E N D I X B

(*Clause 9.5*)

TEST FOR RESISTANCE TO WATER

B-1. PROCEDURE

B-1.1 Grade 1 Boards — The test specimens shall be submerged in a pan of cold water, care being taken that the pieces do not touch the bottom

of the pan. The water shall be heated to $70^\circ \pm 2^\circ\text{C}$ and maintained at this temperature for 3 hours. After this, the test specimens shall be removed from the hot water and plunged immediately into cold water. While still water-soaked, the test specimens shall be tested by forcibly separating the outer layers, using a prising knife.

B-1.2 Grade 2 Boards — The test specimens shall be submerged in a pan of cold water, care being taken that the pieces do not touch the bottom of the pan. After 24 hours, the test specimens shall be removed from the water and while still water-soaked, shall be tested by forcibly separating the outer layers, using a prising knife.

A P P E N D I X C

(*Clause 9.6*)

MYCOLOGICAL TEST

C-1. PROCEDURE

C-1.1 A flat rectangular dish of enamelled iron, glass or porcelain (such as a photographic developing dish) shall be filled to a depth of about 25 mm with saw-dust of non-durable timber, like Semul (*salmania malabarica*), previously moistened with a sufficient amount of an aqueous solution containing 12 g of cane sugar per litre of water. The quantity of sugar solution added should be just enough to moisten the saw-dust completely, and should not be so much as may be squeezed out by hand pressure.

C-1.2 The saw dust shall then be charged with the spores of the commonly occurring Indian fungii and loosely compacted, and the test pieces then pressed down into it so that their upper surfaces are level with the top of the saw-dust layer.

C-1.3 The dish shall then be covered with a sheet of glass and the edges of the dish sealed against the glass with a strip of material, such as 'plasticine' so that the atmosphere round the test pieces shall remain saturated with water vapour.

C-1.4 The dish and the contents shall be maintained at $27^\circ \pm 2^\circ\text{C}$ for a period of two weeks, after which the test pieces shall be removed, washed in cold water and whilst still wet, shall be checked for compliance with the requirements of 9.6.

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AMENDMENT NO. 1 JANUARY 2005
TO
IS 4834 : 1968 SPECIFICATION FOR
VENEERED-WOOD BOARDS FOR PACKING CASES

(*Page 5, clause 7*) — Substitute the following for the existing:

7 DIMENSIONS AND TOLERANCES

7.1 The dimensions of plywood panels shall be as follows:

1 200 mm × 600 mm	1 200 mm × 300 mm
900 mm × 600 mm	900 mm × 300 mm
600 mm × 600 mm	600 mm × 300 mm

7.2 Thickness

The thickness shall be 9 mm, 13 mm, 16 mm and 19 mm.

NOTE — Any other dimensions (length, width and thickness) as agreed to between the manufacturer and the purchaser may also be used.

7.3 Tolerances

Tolerances on the nominal sizes of finished boards shall be as given below:

<i>Dimension</i>	<i>Tolerance</i>
Length	+6 -0 mm
Width	+3 -0 mm

Thickness:

i) Less than 6 mm	±10 percent
ii) 6 mm and above	±5 percent
Edge straightness	2 mm per 1 000 mm or 0.2 percent
Squareness	2 mm per 1 000 mm or 0.2 percent

NOTE — Edge straightness and squareness shall be tested as per Annex A.

- (*Page 7, clause 9.3, first line*) — Substitute ‘Annex B’ for ‘Appendix A’.
- (*Page 7, clause 9.5, first line*) — Substitute ‘Annex C’ for ‘Appendix B’.
- (*Page 7, clause 9.6, first line*) — Substitute ‘Annex D’ for ‘Appendix C’.
- (*Page 8, clause 12.2.1*) — Insert the following Annex A after clause 12.2.1:

ANNEX A (Clause 7.3)

METHOD OF TEST FOR EDGE STRAIGHTNESS AND SQUARENESS

A-1 PROCEDURE FOR EDGE STRAIGHTNESS

A-1.1 The straightness of the edges and ends of plywood shall be verified against a straight edge not less than the full length of the plywood. If the edge on the end of the plywood is convex, it shall be held against the straight edge in such a way as to give approximately equal gap at each end. The largest gap between the straight edge and the edge shall be measured to the nearest millimetre and recorded.

A-2 PROCEDURE FOR SQUARENESS

A-2.1 The squareness of plywood shall be checked with a 1 200 mm × 1 200 mm square, by applying one arm of the square to the plywood. The maximum width of the gap shall be recorded.

(*Pages 8 and 9, Appendix A, Appendix B and Appendix C*) — Rename the appendices as Annex B, Annex C and Annex D, respectively.

**AMENDMENT NO. 2 JUNE 2005
TO
IS 4834 : 1968 SPECIFICATION FOR
VENEERED-WOOD BOARDS FOR PACKING CASES**

(*Page 3, Foreword, clause 0.2.1, line 6*) — Substitute 'IS 1659 : 2004^{*}', for 'IS 1659 : 1960^{*}'.

(*Page 3, footnote marked '*'*) — Substitute the following for the existing:

*Black boards — Specification (*fourth revision*)

(*Page 4, clause 2.0, line 2*) — Substitute 'IS 707 : 1976^{*}', for 'IS 707 : 1968^{*}'.

(*Page 4, footnote marked '*'*) — Substitute the following for the existing:

*Glossary of terms applicable to timber technology and utilization (*second revision*).[†]

(*Page 4, clause 3*) — Substitute the following for the existing:

‘3 GRADE

3.1 Veneered-wood board shall be of MR grade for both storage as well as transit packs.[‡]

(*Page 4, clause 4*) — Substitute the following for the existing:

‘4 MATERIALS

4.1 Timber

4.1.1 Any species of timber may be used for face veneer and core. However, a list of species is given in Annex B of IS 303 : 1989[†] for guidance.

4.2 Adhesives

The adhesive used for bonding purpose shall be of MR type conforming to IS 848 : 1974[‡].

(*Page 4, footnotes marked ‘†’ and ‘‡’*) — Substitute the following for the existing:

*[†]Specification for plywood for general purposes (*third revision*).

[‡]Specification for synthetic resin adhesives for plywood (phenolic and aminoplastic) (*first revision*).[†]

[*Page 8, Annex C (see also Amendment No. 1)*] — Substitute the following for the existing:

ANNEX C
(Clause 9.5)

TEST FOR RESISTANCE TO WATER

C-1 PROCEDURE

C-1.1 The test specimens shall be submerged in a pan of cold water, care being taken that the pieces do not touch the bottom of the pan. The water shall be heated to $60 \pm 2^{\circ}\text{C}$ and maintained at this temperature for 3 h. After this, the test specimens shall be removed from the hot water and plunged immediately into cold water. While still water-soaked, the test specimens shall be tested by forcibly separating the outer layers, using a prising knife.'

[*Page 9; clause D-1.4, line 2 (see also Amendment No. 1)*] — Substitute 'three weeks' for 'two weeks'.